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# The Thirty-first Annual Report

of the

## Maryland State College of Agriculture

### Agricultural Experiment Station



College Park, Prince George County, Maryland

1917-1918

Published by the Station

# The Maryland Agricultural Experiment Station

## The Board of Trustees of the Maryland State College of Agriculture

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### STATION STAFF.

HARRY J. PATTERSON	<i>Director and Chemistry.</i>
J. B. S. NORTON	<i>Botany and Plant Pathology.</i>
E. H. BRINKLEY	<i>Farm Superintendent.</i>
THOMAS H. WHITE	<i>Vegetable and Floriculture.</i>
CHARLES O. APPLEMAN	<i>Plant Physiology.</i>
ROY H. WAITE	<i>Poultry.</i>
C. P. SMITH	<i>Seed Inspector.</i>
W. R. BALLARD	<i>Pomology and Small Fruits.</i>
C. L. OPPERMAN	<i>Supt. Ridgely Farm.</i>
E. N. CORY	<i>Entomology.</i>
A. G. MCCALL	<i>Soils.</i>
R. L. HILL	<i>Biochemistry.</i>
J. E. METZGER	<i>Agronomy.</i>
E. S. JOHNSTON	<i>Associate, Plant Physiology.</i>
R. S. ALLEN	<i>Assistant, Swine Husbandry.</i>
PAUL EMERSON	<i>Soil Bacteriology.</i>
R. C. TOWLES	<i>Assistant, Animal Husbandry.</i>
L. W. ERDMAN	<i>Assistant, Soils.</i>
P. GARMAN	<i>Assistant, Entomology.</i>
W. J. AITCHESON	<i>Assistant, Agronomist.</i>
MISS L. E. CONNER	<i>Librarian.</i>
A. C. KEEFER	<i>Clerk.</i>

The Station is located on the B. & O. R. R. and City and Suburban Electric Car Line, eight miles north of Washington, D. C.

Bell Telephone—Berwyn Exchange.

Visitors will be welcomed at all times, and will be given every opportunity to inspect the work of the Station in all its departments.

The Bulletins and Reports of the Station will be mailed regularly, free of charge, to all residents of the State who request it.

ADDRESS:  
AGRICULTURAL EXPERIMENT STATION,  
College Park, Md.

## MARYLAND STATE BOARD OF AGRICULTURE.

## In Account With

	Dr.	<i>Seed Inspection Fund.</i>	<i>Biological Laboratory.</i>
Balance June 30th, 1917.....		\$2,315.62	\$3,338.33
Receipts for Year 1917-1918.....		5,626.75	10,554.43
Totals .....		<u>\$7,942.37</u>	<u>\$13,892.76</u>
	Cr.		
By Salaries .....		3,840.98	2,749.98
Labor .....		.....	765.21
Postage and Stationery.....		155.19	106.49
Heat, Light, Water and Power.....		6.81	10.26
Chemicals and Laboratory Supplies...		28.28	1,438.83
Seeds, Plants and Sundry Supplies....		5.18	154.10
Tools, Machinery and Appliances.....		1.00	.....
Scientific Apparatus and Specimens...		142.75	312.73
Traveling Expenses.....		488.23	8.00
Contingent Expenses.....		5.00	40.40
Repairs .....		12.07	48.11
Rent .....		.....	35.00
Furniture and Fixtures.....		.....	15.00
Feeding Stuffs.....		.....	1,324.03
Live Stock.....		.....	2,497.59
Repayment of Loan from Soils Fund..		3,000.00	.....
Balance June 30th, 1918.....		256.88	4,387.03
Totals .....		<u>\$7,942.37</u>	<u>\$13,892.76</u>

The above is a true copy from the Books of the Treasurer.

M. F. McKENNEY, *Accountant.*





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THE  
Maryland State College of Agriculture  
AGRICULTURAL EXPERIMENT STATION

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Volume 31

1917-1918

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THE THIRTY-FIRST ANNUAL REPORT  
OF THE MARYLAND AGRICULTURAL  
EXPERIMENT STATION

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FOR THE FISCAL YEAR ENDING JUNE 30, 1918.

By H. J. PATTERSON, Director.

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*To the President and Board of Trustees.*

GENTLEMEN:—In accordance with the requirements of the Act of Congress providing for the Establishment of Agricultural Experiment Stations, I hand you herewith a brief report covering the work of the Maryland Agricultural Experiment Station for the fiscal year ending June 30, 1918.

PUBLICATIONS.

The completed work of the Station as published in the bulletins issued from time to time gives, in the main, an idea of the scope and progress of the investigations being conducted. The bulletins are sent free to all persons in Maryland who request them. There are about twenty thousand names on the general mailing list. There has also been compiled special mailing lists representing the farmers engaged in special kinds of farming. These special lists make it possible to reach the people interested in a particular subject. This saves expenses and prevents waste. The mailing lists have all been revised during the past year. Station bulletins are limited to giving the results of the investigations and only such other matter added as is necessary to insure a proper understanding and use of the results. The development of the Extension Service and its publications takes care of much of the compiled matter that at one time it was necessary to include in the Station bulletins.

The following bulletins were issued this year:

<i>No.</i>	<i>Date.</i>	<i>Subject.</i>	<i>Author.</i>
209	Dec...1917	The Oriental Peach Pest.....	Philip Garman.
210	Jan...1918	Agricultural Seed Inspected in 1916 .....	C. P. Smith.
211	Jan...1918	Strawberry Notes.....	W. R. Ballard.
212	Feb...1918	Physiological Basis for the Prepa- ration of Potatoes for Seed...	C. O. Appleman.
213	Feb...1918	The Control of House Flies by the Maggot Trap.....	E. N. Cory.
214	Mar...1918	Tests of an "All Crops Soil" In- oculum .....	Paul Emerson.
215	Mar...1918	Fertilizing and Cultural Experi- ments with Irish Potatoes.....	Thos. H. White.
216	June..1918	Conditions Detrimental to Seed Production .....	J. B. S. Norton & C. E. Leathers.
217	June..1918	The Relation of Milk Yield to Age at First Calf.....	R. C. Towles.
218	June..1918	Report of Nut Tree Investigations in Maryland.....	Earl S. Johnston.

#### CHANGES IN STAFF.

The following persons have resigned during the year to answer the call of their country and enter the army:

R. L. Hill, Biochemist.

J. M. Arthur, Assistant Plant Physiologist.

P. E. Richards, Assistant Soil Chemistry.

S. Edward Isaeson, Animal Pathologist, resigned to accept a position with a commercial firm manufacturing biological products.

D. G. Sullins, Animal Husbandman, resigned to take up extension work in Connecticut.

Paul Emerson, Soil Bacteriologist, resigned to accept a position with the Idaho Experiment Station.

C. E. Leathers, Assistant Botany, resigned to take up County Agent work in Dorchester County, Maryland.

R. S. Allen has been transferred from the Biological Laboratory to swine investigations.

A. R. Ward, D. V. M., of the U. S. Department of Agriculture, was appointed to the place made vacant by the resignation of Dr. S. Edw. Isaeson.

C. C. Shivers, D. V. M., a graduate of the U. S. Veterinary College, was appointed assistant in the Biological Laboratory.

W. J. Aitcheson, B. S., of Maryland State College, was appointed Assistant Agronomist.

L. W. Erdman, B. S., of Maryland State College, was appointed assistant in the Soil Department.

E. V. Eaton, M. S., of Chicago University, was appointed assistant in Plant Physiology.

## INVESTIGATIONS IN PROGRESS.

The investigations outlined in detail in last year's report are being continued, but the progress with some of them has been slow due to changes in the staff.

The increased cost of salaries, labor and supplies will make it necessary to curtail work to some extent so as to keep expenses within the appropriations. A list of the investigations in progress will not be given here. Persons interested can find the same in the last year's report.

The work in progress may be summarized under the following heads:

1. A study of methods for increasing and maintaining the productive capacity of the principal types of soil in Maryland.

2. A study of the fertilizer requirements of different crops on different kinds of soil.

3. The improving of fruits, vegetables and crops for different sections of the State by selection and breeding.

4. The testing of new crops and varieties for different sections.

5. The introduction into some sections of the State of new crops and systems of cultivation and rotation of crops.

6. The development of disease resistant strains and varieties of fruits, vegetables and crops.

7. A study of methods of insect control.

8. A study of methods for the control of plant and animal diseases.

9. A study of the conditions prevailing in plants during dormancy and the relation of this period to the future development of plants; also the relation of these conditions to the storage of crops.

10. A study of the conditions and factors which influence the food value of milk.

11. Testing methods for feeding and culture of flowers.

12. A study of the relation of feeding, temperature and moisture to variations and mutations in plants.

13. Testing methods for the preparation of biological products for use in protecting animals against diseases.

14. A study of the relation of feeds to the quantity and quality of animal products.

15. A study of the relation of methods of curing meat to quality.

16. A study of the life history of insects.

17. A study of irrigation for humid climates.

18. A study of the relation of organic matter to the bacteria content of soils and of their mutual relation to the productive capacity of the soil.

19. A study of the use of bees for the pollination of greenhouse crops.

20. A study of methods for wintering bees in Maryland.

## FINANCIAL STATEMENT.

The following statements give the details as to the expenditures of the various funds of the Experiment Station for the past fiscal year.

## MARYLAND AGRICULTURAL EXPERIMENT STATION.

In Account With

UNITED STATES APPROPRIATIONS.

DR.

	<i>Hatch Fund.</i>	<i>Adams Fund.</i>
To appropriations for fiscal year 1917-1918 .....	\$15,000.00	\$15,000.00

CR.

By Salaries .....	11,074.14	11,481.52
Labor .....	2,421.48	711.07
Publications .....	787.82	.....
Postage and Stationery.....	9.55	6.72
Freight and Express.....	14.00	.....
Heat, Light, Water and Power.....	6.00	.....
Chemicals and Laboratory Supplies	118.78	1,071.42
Seeds, Plants and Sundry Supplies.	15.34	214.30
Feeding Stuffs.....	412.62	.....
Library .....	16.52	.....
Tools, Machinery and Appliances...	21.48	63.27
Furniture and Fixtures.....	76.50	620.10
Scientific Apparatus.....	12.12	415.09
Traveling Expenses.....	.....	24.44
Contingent Expenses.....	.....	21.23
Repairs .....	13.65	370.84
Total.....	\$15,000.00	\$15,000.00

## MARYLAND AGRICULTURAL EXPERIMENT STATION.

In Account With  
THE STATE APPROPRIATIONS.

DR.			
	<i>General Fund.</i>	<i>Hort. Fund.</i>	<i>Ridgely Farm.</i>
Balance June 30th, 1917.....		\$13.98	\$406.04
Receipts for year 1917-1918.....	28,184.90	3.99	6,630.79
Totals.....	\$28,184.90	\$17.97	\$7,036.83
CR.			
By Salaries .....	9,171.95	.....	1,845.00
Labor .....	3,052.21	13.98	1,066.80
Publications .....	1,183.02	.....	.....
Postage and Stationery.....	552.95	1.01	56.28
Freight and Express.....	685.30	.....	22.30
Heat, Light, Water and Power...	1,080.83	.....	2.70
Chemicals and Laboratory Sup- plies .....	222.41	.....	.....
Seeds, Plants and Sundry Sup- plies .....	1,346.85	.....	217.95
Fertilizers .....	198.75	.....	132.08
Feeding Stuffs.....	5,076.96	.....	104.38
Library .....	561.38	2.98	.....
Tools, Machinery and Appliances	612.42	.....	188.28
Furniture and Fixtures.....	91.27	.....	.....
Scientific Apparatus and Speci- mens .....	111.49	.....	.....
Live Stock.....	185.71	.....	.....
Traveling Expenses.....	487.61	.....	29.71
Contingent Expenses.....	80.90	.....	69.01
Repairs .....	1,539.02	.....	680.38
Rent .....	354.80	.....	.....
Overdraft June 30, 1917.....	1,615.54	.....	.....
Balance June 30th 1918.....	.....	.....	2,621.96
	\$28,211.37	\$17.97	\$7,036.83
Overdraft June 30th, 1918....	26.47		

## MARYLAND AGRICULTURAL EXPERIMENT STATION.

In Account With

DR.		
	<i>Soil Fund.</i>	<i>Farm Sales.</i>
Balance June 30th, 1917.....	*\$9,245.61	\$909.55
Repayment of Loan to Seed Inspection Fund	3,000.00	.....
Refund of Freight.....	15.23	.....
Receipts for year 1917-1918.....	.....	14,822.48
Totals .....	\$12,260.84	\$15,732.03
CR.		
By Salaries .....	3,360.66	.....
Labor .....	670.72	10,843.67
Postage and Stationery.....	59.59	38.98
Freight and Express.....	6.60	270.34
Heat, Light, Water and Power.....	.85	39.60
Chemicals and Laboratory Supplies...	100.42	211.72
Seeds, Plants and Sundry Supplies...	325.13	292.04
Fertilizers .....	5.00	26.88
Tools, Machinery and Appliances.....	6.35	460.07
Furniture and Fixtures.....	6.30	.....
Scientific Apparatus and Specimens...	96.82	93.65
Traveling Expenses.....	706.78	625.67
Repairs .....	359.03	218.71
Rent .....	12.50	60.00
Feeding Stuffs.....	.....	722.40
Contingent Expenses.....	.....	114.51
Live Stock.....	.....	381.00
Balance June 30th, 1918.....	6,544.09	1,332.79
Totals .....	\$12,260.84	\$15,732.03

\*Loan to College Fund year 1916-1917 to be repaid Oct. 1st, 1918, \$13,000.00.

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M. F. McKENNEY, *Accountant.*





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